Logistics and Procurement Department. The Logistics and Procurement Department also inspects vehicles and provides route maps to the drivers. Hazardous waste shipments are the responsibility of the Hazardous Waste Program within the Environmental Operations Department. During calendar year 2000, 109 shipments (including 76 waste shipments) containing hazardous material left SNL/CA (SNL/CA 2002b).

Transportation of Nonhazardous Materials and Waste

Other transportation on site includes the movement of nonhazardous materials (office furniture, computers, mail, etc.). These materials are received and transported to their final destination by the Logistics and Procurement Department (SNL/CA 2002b).

Nonhazardous solid waste is trucked to a local landfill. Waste pickup is performed once per week (SNL/CA 2002b).

4.11 WASTE GENERATION

4.11.1 Definition of Resource

Waste management activities consist of managing, storing, and preparing for offsite disposal of all wastes in accordance with applicable Federal and state regulations, permits obtained under these regulations, and DOE orders. The waste categories generated onsite under normal operations include radioactive waste (including LLW and LLMW); hazardous waste, which includes RCRA hazardous (chemical and explosives) waste, California Toxic waste, TSCA waste (primarily asbestos and polychlorinated biphenyls [PCBs]) and biohazardous (medical) waste; and nonhazardous solid waste and process wastewater.

4.11.2 Region of Influence

The ROI for waste generation involves SNL/CA and its facilities. The ROI does not include offsite waste disposal facilities because they involve the private sector or other Federal facilities. The transportation of waste to disposal sites is discussed in Section 4.10.

4.11.3 Affected Environment

The generation of the many different waste streams at SNL/CA creates a continuous need for proper packaging, labeling, manifesting, transporting, storing, and disposing solutions.

4.11.3.1 Normal Operations

The affected environment considered under this analysis is limited to those facilities that generate waste under normal operations at SNL/CA. Normal operations encompass all current operations that are required to maintain research and development at SNL/CA facilities.

Waste Categories

Low-Level Waste (LLW)—Waste that contains radioactivity and is not classified as high-level waste, transuranic waste, or spent nuclear fuel or by-product tailings containing uranium or thorium from processed ore (as defined in Section 11[e][2] of the *Atomic Energy Act* [42 U.S.C. §2011]). Test specimens of fissionable material, irradiated for research and development only and not for the production of power or plutonium, may be classified as LLW, if the concentration of transuranic is less than 100 nanocuries per gram (nCi/g).

Low-Level Mixed Waste (LLMW)—Waste that contains both hazardous waste regulated under the RCRA and low-level waste.

RCRA Hazardous Waste—Any solid waste (definition includes semisolid, liquid, or gaseous material) listed in Subpart D of 40 CFR Part 261, or having the characteristics of ignitability, corrosivity, toxicity, or reactivity, defined by the RCRA.

SNL/CA Hazardous Waste—Waste includes RCRA hazardous waste, California Toxic waste, TSCA waste, and Biohazardous wastes.

Municipal Solid Waste—Waste includes office and laboratory trash.

4.11.3.2 New Operations

Several new operations are currently in the planning stages at SNL/CA. However, they are considered outside of the scope of the current affected environment description for this analysis because they have not yet reached operational status. New operations are defined as programmatically planned projects with defined implementation schedules that will take place in the future. SNL/CA has identified operations at three facilities that fall under this category: LIGA Technology Facility (LTF), Distributed Information Systems Laboratory (DISL), and Glass Furnace and Melting Laboratory.

4.11.3.3 Special Projects

Special projects are limited-duration projects, such as construction, that are considered separately from facility operations. These projects can make a large contribution to the overall waste generation activities at SNL/CA. However, special projects and new programs routinely undergo program-specific assessments to consider any impacts that may result from their inception and are, therefore, not considered in-depth in the SWEA.

Facility maintenance and infrastructure support operations would continue (as outlined in Section 2.3.3) with

refurbishment, renovation, and removal of outdated facilities. SNL *Sites Comprehensive Plan* identifies the specific structures under consideration over the next ten years (SNL 2001c). This program will potentially generate large volumes of TSCA waste, primarily asbestos, and building debris that will increase SNL/CA's disposal needs. Four buildings, accounting for 15,000 gsf (an estimated 100 tons of construction debris), are scheduled for removal within fiscal year (FY) 2002. Future space reduction at SNL/CA will focus on temporary buildings that are beyond their useful lives. These buildings will become vacant after new buildings are built. Eighteen buildings, accounting for 40,000 gsf, are categorized as temporary (SNL 2001c).

Building debris estimates associated with decontamination and decommissioning (D&D) projects are included in the assessments of the waste generated from existing operations (potentially 266 tons of debris). Separate NEPA review may be required in the future depending on the scale and extent of the work involved.

4.11.3.4 Radioactive Waste

Radioactive waste generated at SNL/CA includes LLW and LLMW. SNL/CA does not manage or generate transuranic waste (TRU) or mixed transuranic waste. SNL/CA does not manage or generate high-level waste. LLW and LLMW are produced primarily in laboratory experiments and component tests.

As part of the effort to minimize the total quantity of radioactive waste that is generated at SNL/CA, facilities that generate this type of waste are designated as Radioactive Materials Management Areas (RMMA). An RMMA is an area where the reasonable potential exists for contamination due to the presence of unconfined or unencapsulated radioactive material or an area that is exposed to sources of radioactive particles (such as neutrons and protons) capable of causing activation. Managers of facilities must document the location of all RMMAs. Procedures to minimize the generation of radioactive wastes are then developed.

SNL/CA does not maintain the capability to treat or dispose mixed wastes onsite. SNL/CA treats and disposes LLMW offsite under the Federal Facility Compliance Order issued jointly to Sandia Corporation and the DOE (SNL/CA 2002b).

4.11.3.5 Historic and Current Radioactive Waste Generation

Radioactive waste has historically been generated from R&D activities that used radioactive materials. Table 4-10 summarizes historic and current radioactive waste quantities generated onsite from 1996 through 2000.

Table 4-10. Radioactive Waste Generated from 1996 through 2000 (in kilograms)

Radioactive Waste Generated	LLW	LLMW
1996	2,268	0
1997	2,007	0
1998	1,429	7
1999	7,981	80
2000[a]	12,755	2,167
5 yr Average	5,288	451

Source: SNL/CA 2002b
[a]Large increase in waste in year 2000 can be attributed to the demolition of Building 913
LLW: low-level waste
LLMW: low-level mixed waste

4.11.3.6 Hazardous Waste

Hazardous waste refers specifically to nonradioactive waste, including RCRA chemical and explosives waste, California toxic hazardous waste, biohazardous (medical) waste, and TSCA waste (primarily asbestos and PCBs).

4.11.3.7 Historic and Current Hazardous Waste Generation

The hazardous waste generated at SNL/CA is predominantly chemical laboratory trash generated from experiments, testing, other R&D activities, and infrastructure fabrication and maintenance. Table 4-11 contains a summary of hazardous waste generated for all operations from 1996 through 2000. Biohazardous (medical) waste and D&D wastes were included in the totals for all hazardous waste categories.

4.11.3.8 Municipal Solid Waste

Solid waste consists predominantly of office and laboratory nonhazardous trash. Nonhazardous building debris generated from D&D activities may also be considered solid waste. All solid waste is currently disposed of at the Vasco Road Landfill in Livermore, California (SNL/CA 2002b). In calendar year (CY) 2000, SNL/CA generated 247.54 metric tons.

4.11.3.9 Pollution Prevention and Waste Minimization

DOE 5400.1 and Executive Order (EO) 13148 implement a pollution prevention program to comply with DOE requirements (65 FR 24595). The SNL/CA Pollution Prevention Program applies to all pollutants generated by routine and nonroutine operations. The scope of the Pollution Prevention Program includes activities that encourage pollution or waste source reduction and recycling, resource and energy conservation, and affirmative procurement of EPA-designated recycled products.

Table 4-11. Hazardous Waste Generated from 1996 through 2000 (in kilograms)

Hazardous Waste Generated	RCRA	California Toxic[a]	TSCA	Biohazardous	Total All Hazardous Waste
1996	15,003	10,792	15,451	219	41,465
1997	23,294	26,088	55,730	1,773	106,885
1998	23,468	39,841	13,782	296	77,387
1999	22,962	20,084	27,473	248	70,767
2000[b]	28,354	32,765	79,477	220	140,816
5-year Average	22,616	25,914	38,383	551	87,464

Source: SNL/CA 2002b
[a]A non-RCRA waste identified in Title 22 CCR
[b]Except for biohazardous, large increases in waste in year 2000 can be attributed to the demolition of Building 913.
MWMA: *Medical Waste Management Control Act*
RCRA: *Resource Conservation and Recovery Act*
TSCA: *Toxic Substance Control Act*

4.11.3.10 Trends and Requirements

In 2000, SNL set goals to reduce routine waste generation by 40 to 50 percent.

4.11.3.11 Waste Minimization

Waste minimization activities are not included in the previous descriptions to bound maximum waste projections for any given year. The following wastes are tracked to determine SNL/CA's effectiveness in reducing wastes: LLW and LLMW, RCRA, state-regulated, TSCA, and sanitary waste. In addition, reductions of resource and energy use are tracked.

Following are the goals to be completed:

- Reduce routine RCRA waste by 14.59 metric tons.
- Reduce routine non-RCRA waste by 10.63 metric tons.
- Reduce routine TSCA waste by 0.37 metric tons.
- Reduce routine LLW by 17.28 cubic meters (m^3).
- Reduce routine LLMW by 1.24 m^3.
- Reduce routine solid waste by 1,422 metric tons.
- Increase procurement of EPA-designated recycled products to 100 percent in 2005, except where they are not commercially available competitively at a reasonable price or do not meet performance standards.
- Reduce annual energy use per square foot in regular buildings by 30 percent from FY 1985 to FY 2005. Reduce annual energy use per square foot in regular buildings by 40 percent by FY 2010.
- Reduce annual energy use per square foot in energy-intensive buildings by 20 percent from FY 1990 to FY 2005. Reduce annual energy use per square foot in energy-intensive buildings by 25 percent by FY 2010 (SNL/CA 2002b, SNL 2001g).

4.11.3.1 Recycling

Table 4-12 presents CY 2000 recycling information for SNL/CA by material type.

Table 4-12. Material Recycled in Calendar Year 2000 (in kilograms)

Material	Amount	Material	Amount
Coolants	690	Aluminum cans	470
Elemental mercury	9	Construction debris	6,805,170
Fluorescent light bulbs	5,030	Oil filters	240
Glass	0	Paper/cardboard	42,010
Batteries	2,270	Scrap metals	86,790
Transparencies	20	Tires	760
Toner cartridges	750	Used oil	3,340
Yard waste	45,390	Metal drums	210

Source: SNL/CA 2002b